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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---------------------------|-------------|----------------------|-----------------------|------------------|
| 10/559,923 | 12/08/2005 | Yoshinari Tsukada | SHM-16366 | 1496 |
| 40854 | 7590 | 01/11/2008 | EXAMINER | |
| RANKIN, HILL & CLARK LLP | | | WILLIAMS, ALEXANDER O | |
| 38210 Glenn Avenue | | | ART UNIT | PAPER NUMBER |
| WILLOUGHBY, OH 44094-7808 | | | 2826 | |
| MAIL DATE | | DELIVERY MODE | | |
| 01/11/2008 | | PAPER | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | |
|------------------------------|------------------------|---------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/559,923 | TSUKADA ET AL. |
| | Examiner | Art Unit |
| | Alexander O. Williams | 2826 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 12/8/05.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-6 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 - 1) Certified copies of the priority documents have been received.
 - 2) Certified copies of the priority documents have been received in Application No. _____.
 - 3) Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
 Paper No(s)/Mail Date 12/8/05.

- 4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date _____.
- 5) Notice of Informal Patent Application
- 6) Other: _____.

Serial Number: 10/559923 Attorney's Docket #: SHM-16366
Filing Date: 4/23/2004: claimed foreign priority to 6/10/2003

Applicant: Tsukada et al.

Examiner: Alexander Williams

Applicant's Pre-Amendment filed 12/8/05 has been acknowledged.

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Note: In claim 4, lines, 4-5, in the phrase "interposed between the the semiconductor element", one of the "the" should be deleted.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:
A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-6 are rejected under 35 U.S.C. § 102(b) as being anticipated by Arakawa et al. (U.S. Patent # 4,497,875).

1. Arakawa et al. (figures 1 to 4) specifically figure 4 show a semiconductor device comprising: a semiconductor element **731**; a first metal plate **63** bonded to one side of the semiconductor element; an intermediate layer **23** bonded to one side of the first metal plate remote from the semiconductor element, the intermediate layer being made of a carbon-copper composite

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material; a second metal plate **33** bonded to one side of the intermediate layer remote from the first metal plate; an insulating member **1** bonded to one side of the second metal plate remote from the intermediate layer; and a third metal plate **4** bonded to one side of the insulating member remote from the second metal plate, the third metal plate having a thickness substantially equal to that of the second metal plate; and, a heat sink **5**; wherein the first, second and third metal plates are made of a same material.

2. The semiconductor device according to claim 1, Arakawa et al. show wherein the intermediate layer is adapted to moderate thermal stress.

3. Arakawa et al. (figures 1 to 4) specifically figure 4 show a semiconductor device comprising: a semiconductor element **731**; a heat sink **5**; a laminar plate **63,23,33,1,4** provided between the semiconductor element and the heat sink, said laminar plate including an intermediate layer for moderating thermal stress.

4. The semiconductor device according to claim 3, Arakawa et al. show wherein the laminar plate comprises a first metal plate **63**, the intermediate layer **23**, a second metal plate **33**, an insulating member **1**, and a third metal plate **4**, wherein: said first metal plate being interposed between the the semiconductor element and the intermediate layer, said first metal plate having one side bonded to the semiconductor element and an opposite side bonded to a first side of the intermediate layer; said second metal plate being interposed between the intermediate layer and the insulating member, whereby one side

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of said second metal plate is bonded to a second, opposite side of the intermediate layer and the other side of said second metal plate is bonded to a first side of the intermediate layer; and said insulating member is interposed between the second and third metal plates, whereby said third metal plate is bonded to a second opposite side of the insulating member.

5. The semiconductor device according to claim 4, Arakawa et al. show wherein a thickness of the second metal plate is equal to a thickness of the third metal plate.
6. The semiconductor device according to claim 3, Arakawa et al. show wherein the intermediate layer for moderating thermal stress comprises a carbon-copper composite material.

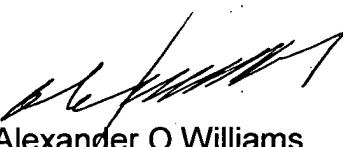
The listed references are cited as of interest to this application, but not applied at this time.

| Field of Search | Date |
|---|--------|
| U.S. Class and subclass: 257/706,717,712,713,675,e23.11 | 1/4/08 |
| Other Documentation: foreign pate. nts and literature in 257/706,717,712,713,675,e23.11 | 1/4/08 |
| Electronic data base(s): U.S. Patents EAST | 1/4/08 |

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander O. Williams whose telephone number is (571) 272 1924. The examiner can normally be reached on M-F 6:30AM-7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue Purvis can be reached on (571) 272 1236. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Alexander O Williams
Primary Examiner
Art Unit 2826

AOW
1/6/08